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(58) Field of search
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B5D
Selected US specifications from IPC sub-class s
B31B B65D

(54) Manufacture of bags

(57) A tube 10 is held in position between two superposed synthetic plastics walls of a bag by a light seam welding operation, with no special precautions taken in this step to make the joint leakproof. The bag and tube combination is then placed between the blocks of a mould, having confronting recesses and molten plastics material is injected to fill these recesses. The injected material forms a collar 22 which completely surrounds the tube. The bag film material on either side of the tube is melted to itself and to the tube wall, and the collar is securely attached in an encircling configuration so precluding leakage.

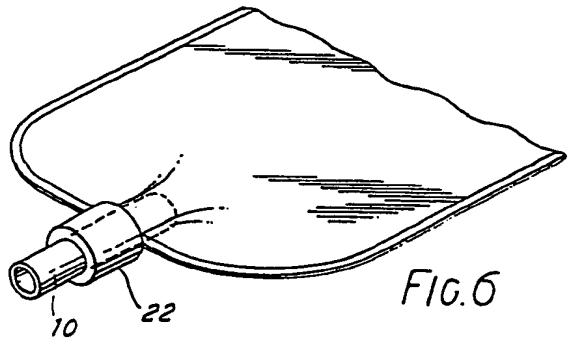

FIG.6

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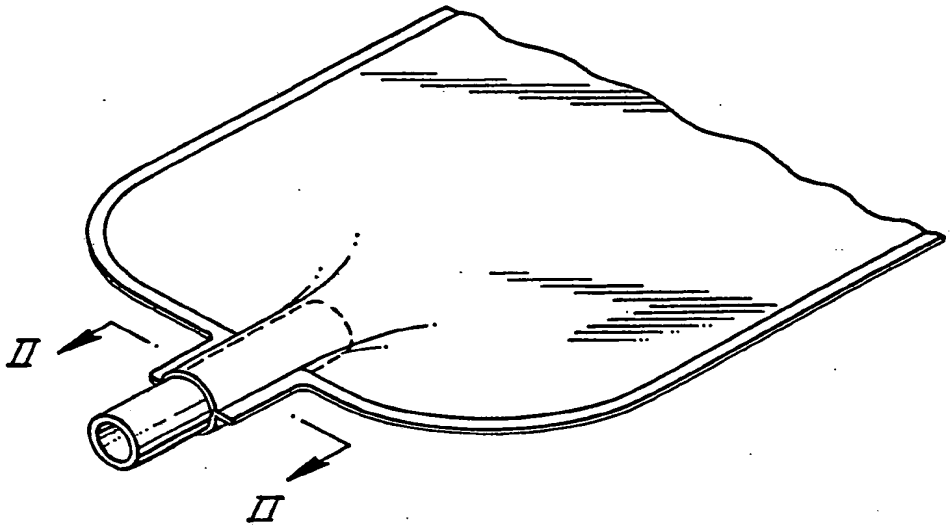

FIG. 1

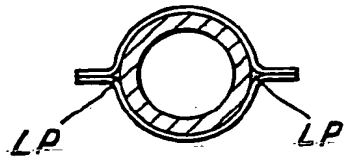

FIG. 2

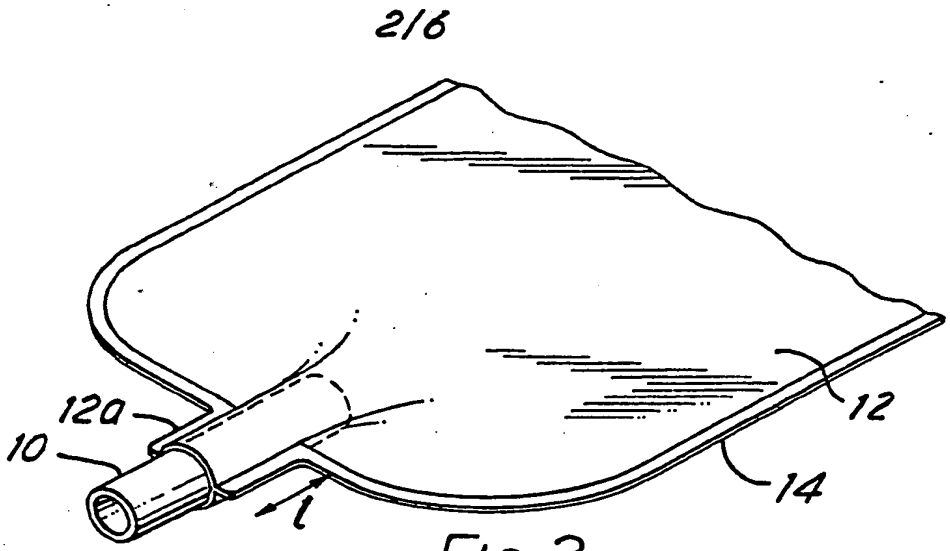

FIG. 3

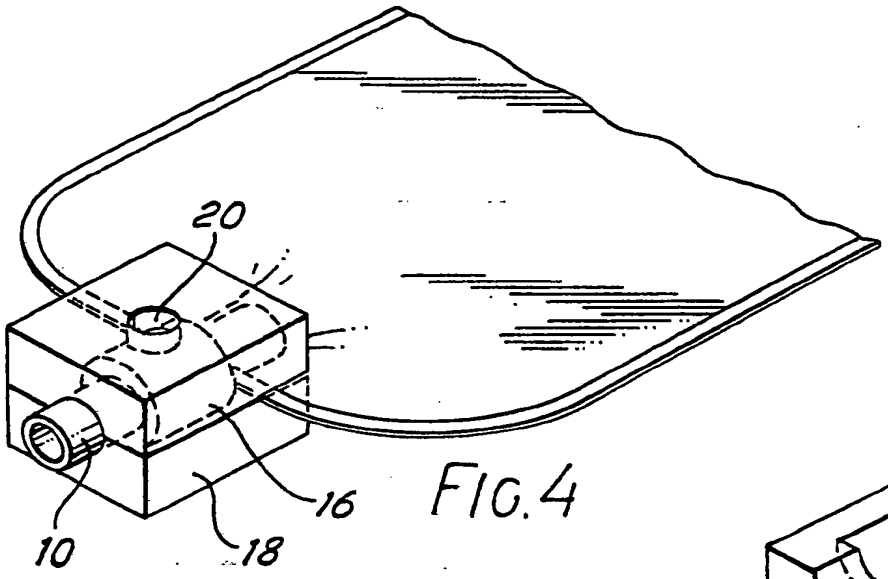

FIG. 4

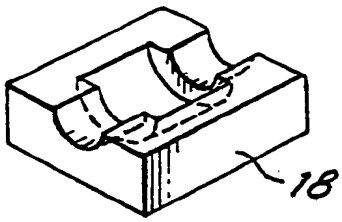

FIG. 5

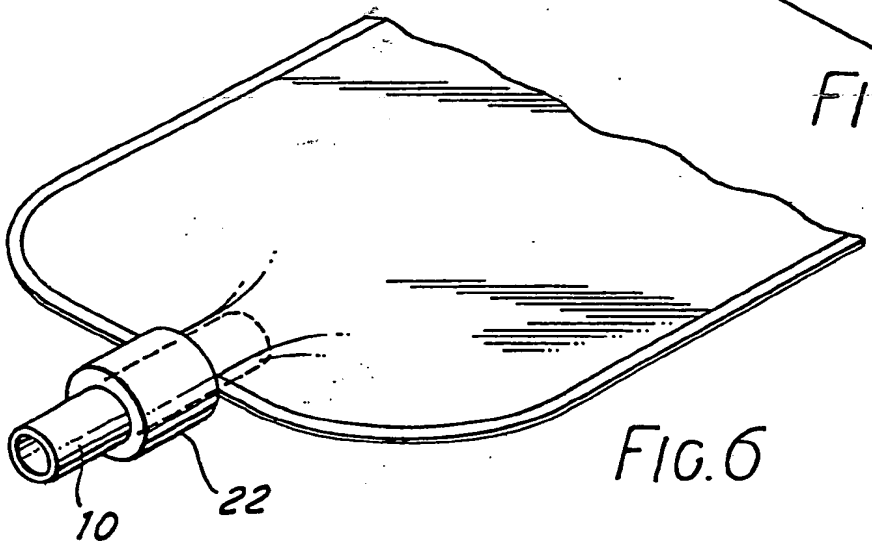

FIG. 6

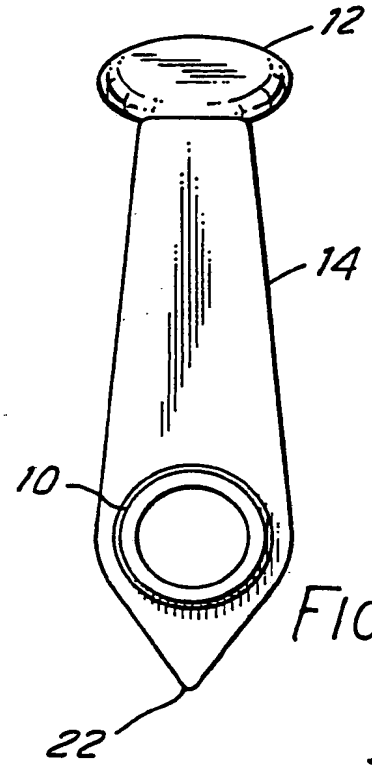

FIG. 7

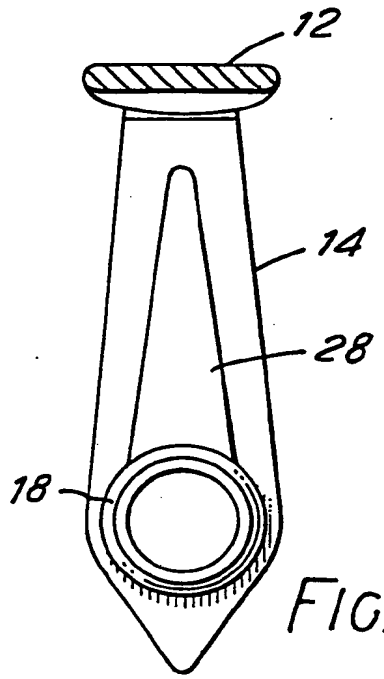

FIG. 9

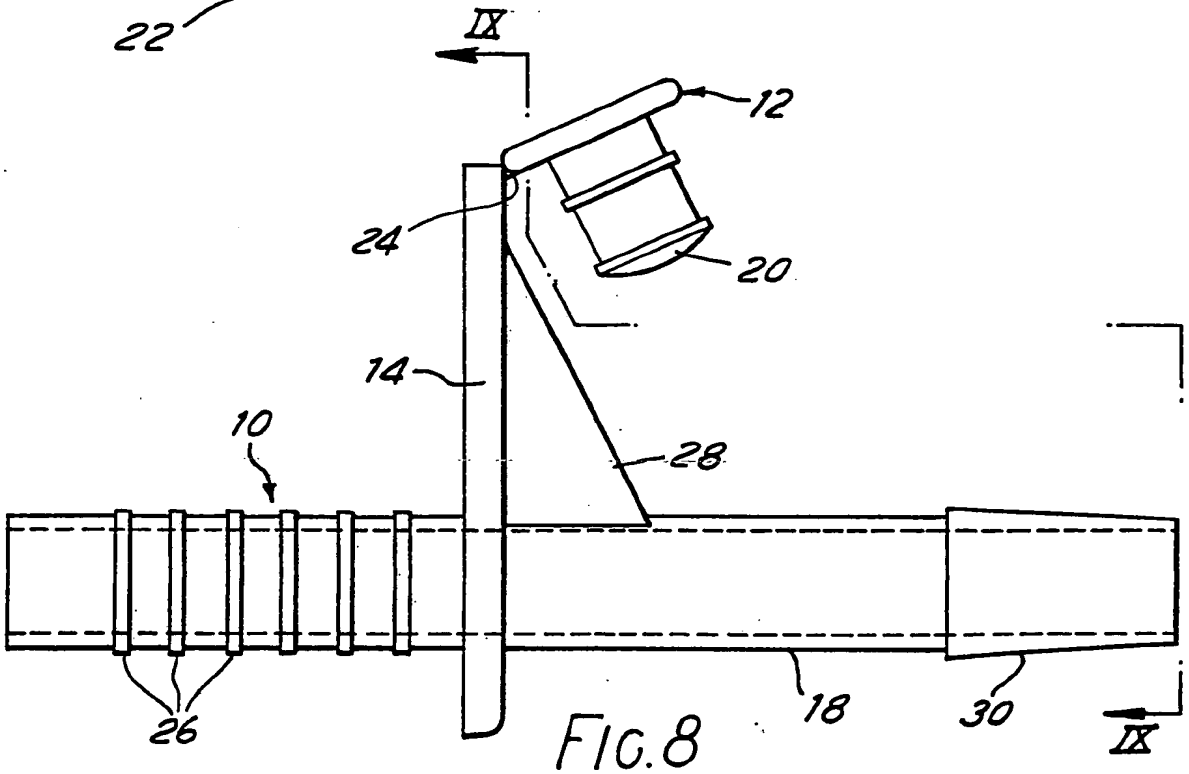

FIG. 8

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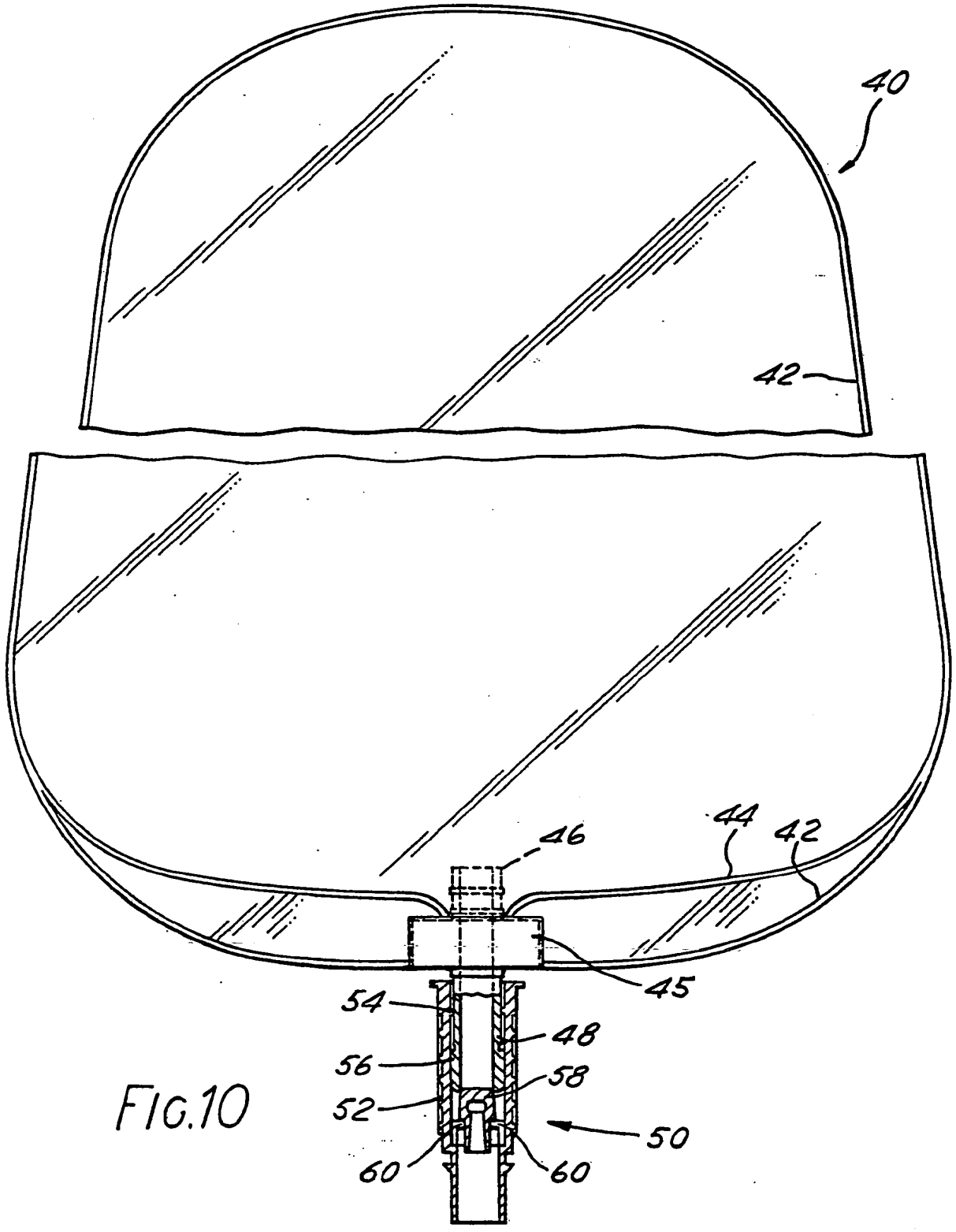

FIG.10

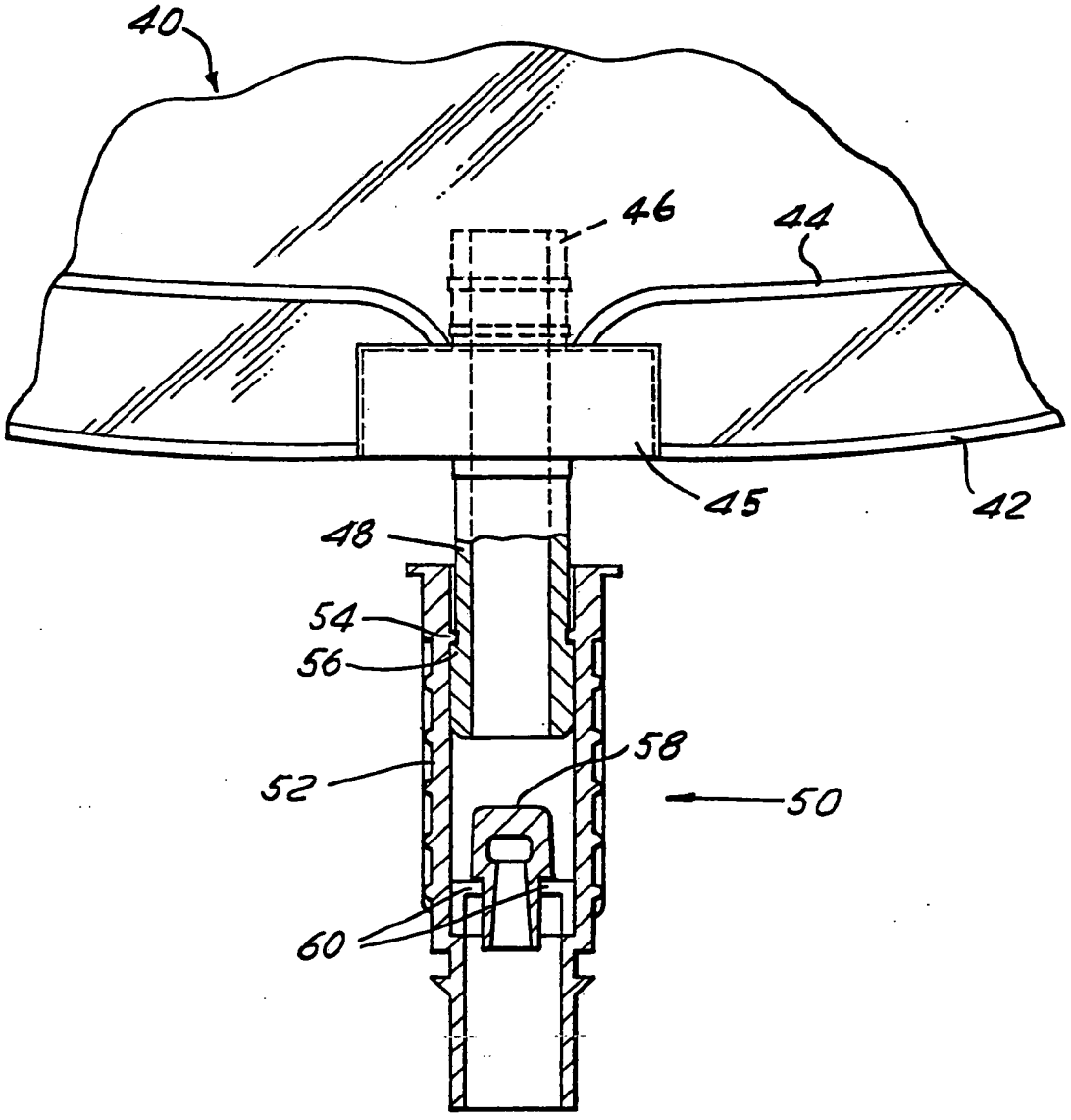

FIG. 11

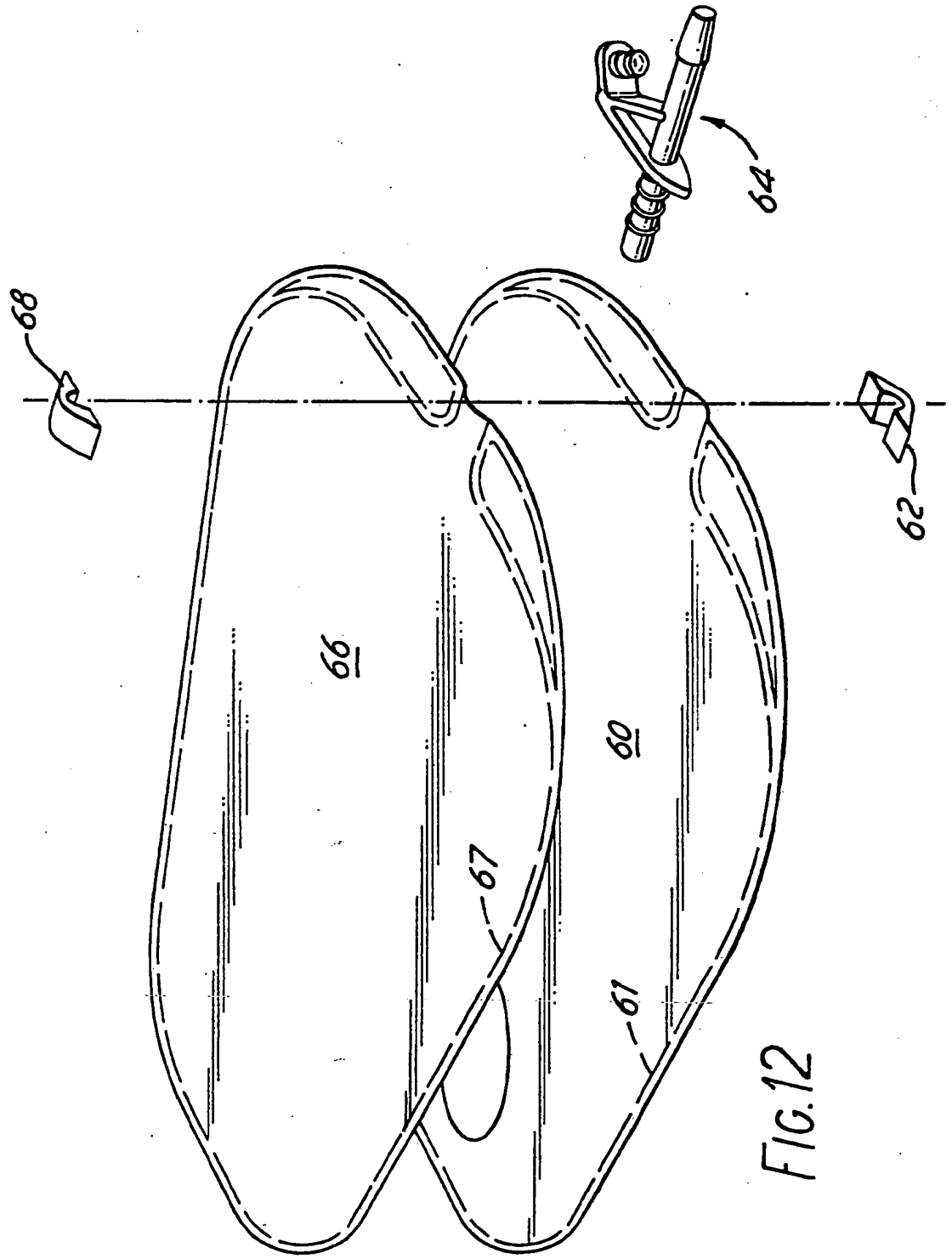

FIG. 12

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MANUFACTURE OF BAGS

This invention relates to the manufacture of bags for containing liquids, and to the bags themselves.

Bags such as urostomy bags, urine bags, colostomy bags, etc. commonly have two superposed sheets of plastics material welded around their periphery. The weld may be radio-frequency welding or heat welding. It is often desired to have an outlet tube from a lower region of the bag. Such tubes are often also plastics material. One proposal for heat welding a tube to a bag is shown in U.S. Patent 4 023 607 of O.R. Jensen et al. Problems arise when making weld joints to fix the tube to the two bag walls in a leak-proof manner. In particular, there frequently exist two leak paths at the locations indicated LP in Figure 2 of the accompanying drawings. This problem is particularly acute with bags for containing urine because urine has a low surface tension and will readily find any leak path. Welding a plastics tube between bag walls is a particularly difficult problem when one is employing multi-film laminate material for each bag wall, some of the layers of the laminate being intended to provide strength and liquid impermeability and one or more other layers of the laminate being particularly directed to providing gas impermeability. In the context of a rate of manufacture of bags of up to 2000 per hour, and using a thin multi-laminate film as the bag wall, joining such walls to a tube of appreciable wall thickness presents difficulties in delivering a suitable amount of heat both to the thin bag wall film and to the relatively thick tube wall.

According to the present invention, a tube is held in position between two superposed walls of a bag by a light seam welding operation, no special precautions in this step being taken to make the joint leakproof. Thereafter, the bag and tube combination is placed between the blocks of a mould, each having confronting recesses of a particular shape, and molten plastics material is injected to fill these recesses, the injection being done, as normal, under heat and pressure. This injected material forms a collar which completely surrounds the tube, the bag film material on either side of the tube having been melted to itself and to the tube wall and the collar being securely attached in an encircling configuration so precluding leakage.

The invention accordingly provides a bag for containing liquids in which a joint between an outlet tube and superposed portions of the bag walls is encircled by a collar of mouldable synthetic plastics material moulded thereon under heat and pressure. In this way, it is possible in most cases to produce a bag outlet which does not have any leak paths.

In another aspect of the invention, a method for manufacturing a bag for containing liquids comprises the steps of seam welding an outlet tube in position between superposed bag walls and, as a second step, injection moulding a collar of synthetic plastics material, chosen to be compatible with the bag walls and tube, around the tube, the collar being moulded under heat and pressure so as to close off any leak paths.

The tube may be a part of any kind of tap or other outlet fitting.

According to a particular embodiment of the invention, a push-pull type tap is welded between the walls of a drainage or an ostomy bag.

The invention will be better understood from the following description of non-limiting embodiments thereof, given with reference to the accompanying drawings in which:-

Figure 1 is a perspective view of a bag having an outlet tube attached thereto in a conventional manner;

Figure 2 is a cross-section on the line II-II of Figure 1 illustrating the two leak paths LP which frequently occur with this method despite all efforts to avoid them;

Figure 3 illustrates the first step of one example of method according to the present invention, in perspective view;

Figure 4 illustrates the second step of the method;

Figure 5 is a perspective view of one of the two mould blocks making up the mould for the injection moulding step;

Figure 6 is a perspective view similar to Figures 1 and 3 illustrating the completed bag having a collar surrounding the tube and integrated with it and the associated portions of the bag walls;

Figure 7 is an end view of a form of bag outlet which incorporates an integral stopper;

Figure 8 is a front view of the outlet shown in Figure 7;

Figure 9 is a cross-section on the line IX - IX of Figure 8.

Figure 10 is a front view of a drainage bag including a welded-in push-pull type outlet tap;

Figure 11 is a view similar to Figure 10 but showing the outlet tap in its open (pulled down) condition; and

Figure 12 is a perspective view illustrating an embodiment of the invention.

Referring to Figures 3-6, in the method according to the invention, a plastis tube 10 is lightly seam welded by the illustrated seam weld 15 between the two superposed bag films 12 and 14. The tube may itself be an injection moulded tube and may be ribbed. As a second step, the intermediate product so produced is placed between two mould blocks 16 and 18, Figure 4, whose shape can be seen from Figure 5. The upper block 16 has an injection port 20 for entry of synthetic plastics material and the remaining portions of the injection moulding apparatus are not shown since they are conventional and will be familiar to a man of average skill in this art. The mould blocks 16 and 18 are shaped to define an encircling collar which extends axially of the tube length substantially equal to the length l indicated in Figure 3. In the second stage of the manufacturing method, molten synthetic plastics material which is compatible with the tube material and the bag film material is injected through the hole 20 under heat and pressure. Polyethylene, particularly high density polyethylene, is suitable. For use with some film materials containing or made of e.v.a., it may be desirable to use for the injected plastics material a plastics material which includes up to 10% of e.v.a. to obtain compatibility with the bag film. The skilled man in the art will naturally choose suitable materials in the light of the bag film being used. Temperatures and pressures conventionally employing in injection moulding the chosen plastics material are suitable in this instance. The injected material is then allowed to cool and the blocks are opened. During the cooling, the collar shrinks, which reduces the likelihood of leak paths being formed. The resulting product is illustrated in Figure 6. As will be seen, an outer collar 22 is moulded around and integrated with the

material of the tube 10 and the portions 12a, 14a, (Figure 3) of the bag film material. Due to the application of heat and pressure during the injection moulding step, the likelihood of the resulting product having leak paths such as leak paths LP of Figure 2 is greatly reduced.

Referring now to Figures 7-9, the illustrated bag outlet tube 10 includes an integral stopper 12. The tube 10 is made in one piece with a bag wall attachment block 14, a web 16 and an outlet portion 18. The latter is flexible so that the tube 18 can be folded up and its open end engaged with the stopper 12 whereby an obturating member 20 of the stopper 12 closes the outlet end of the tube portion 18.

The attachment block 14 has a shape as seen in plan which tapers sharply to one end 22 of the block and tapers less sharply to the other end of the block. At this end of the block 14 there is a relatively stiff, integral connection 24 to the stopper 12. This permits a slight amount of flexing of the stopper relative to the block 14. The tube 10 has peripheral ribs 26 on its outer surface in the region above the block 14; these assist in securing good adhesion without leakage when the bag walls are united with the outlet in the manner described above. A web 28 is provided integral with the block 14 and the tube outlet portion 18 to prevent undesired flexing of the portion of the tube 18 near to the block 14. A tapered fitting 30 is integral with the outlet portion 18.

Figures 10 and 11 illustrate a different embodiment of the invention. A bag 40 for receiving urine has front and rear walls welded together around the periphery by welds 42 and 44. At the outlet region between the walls is located a block 45 which is tapered suitably to merge with the walls, as is known in the art (see for example British Patent No. 1 308 519 now expired). The block 45 is made integral with a first tube 46 and a second tube 48 which forms the inner member of a push-pull tap 50. The movable member of the tap 50 is generally identified 52 and is axially slidable relative to the tube 48. The lower limit of this axial sliding movement is determined, as best seen in Figure 11, by engagement of an internal flange 54 on the tube 52 with a peripheral rib 56 on the tube 48. This defines the open condition of the tap 50.

The upper limiting (closed) condition of the tap 50 occurs when an obturating member 58 mounted internally within the tube 52 by radial arms 60 (in spider fashion) is in engagement with the lower end of the tube 48. In this position the obturating member 58 closes the opening at the lower end of the tube 48 and stops the urine escaping from within the bag. Suitable guide means (not shown) are provided to ensure that the tube 52 slides truly axially relative to the tube 48 but the sizing and engagement of the parts is chosen so that the friction is sufficient to keep the tap normally closed.

This kind of tap is readily integrated with a bag in the same operation by which the walls of the bag are welded together. This leads to a considerable reduction in the cost of manufacture and yet yields a virtually leakproof bag having an integral tap. While a push-pull tap has been illustrated, in Figures 10 and 11 other kinds of tap can be employed with equal or greater advantage. The integration achieved by the disclosed method between the parts 42, 44, 45 and 46 is such that the difficult problem of leakage in this area is almost 100% overcome.

Figure 12 illustrates a step in a preferred assembly method in accordance with the invention. An ostomy bag rear wall formed by a film 60 is laid in a suitable injection moulding machine on top of a shaped block 62. An outlet means 64 (which may be in accordance with Figures 7-9 or Figure 10 and 11 but is illustrated as a simple spigot having an integral plug) is placed in an appropriate location on the film 60. A front wall formed by a film 66 is then laid over. Finally a block 68, similar to block 62 is placed on the film 66 above the outlet means 64. The blocks 62 and 68 are of synthetic plastics material compatible with that of the film and the outlet means 64. A seam welding step is then carried out to bond together the peripheries of the films 60, 66 at the seams indicated 61, 67, and to trap the outlet means 64 therebetween. Reliance is not placed on this operation to achieve a leakproof joint between the outlet means 64 and the films 60, 66. Thereafter, an injection moulding operation is carried out, under the application of heat and pressure, to bond securely together the parts 60-68. The resulting ostomy bag is found to be free of leaks, due to the thorough unification of the parts 60, 62, 64, 66 and 68 by the disclosed method.

CLAIMS

1. A method of manufacturing a bag in which a tube is held in position between two superposed walls of a bag by a light seam welding operation, no special precautions in this step being taken to make the joint leakproof, the bag and tube combination is placed between two blocks of a mould, each block having a recess confronting a complementary recess in the other, and injecting a molten plastics material to fill these recesses, to form a collar which completely surrounds the tube, the bag film material on either side of the tube having been melted to itself and to the tube wall and the collar being securely attached in an encircling configuration so precluding leakage.

2. A bag for containing liquids in which a joint between an outlet tube and superposed portions of the bag walls is encircled by a collar of mouldable synthetic plastics material moulded thereon under heat and pressure.

3 A method for manufacturing a bag for containing liquids comprising a step of seam welding an outlet tube in position between superposed bag walls and, as a second step, injection moulding a collar of synthetic plastics material, chosen to be compatible with the bag walls and tube, around the tube, the collar being moulded under heat and pressure so as to close off any leak paths.

4. A method according to claim 1 or 3 in which the tube is part of a tap or other outlet fitting.

5. A bag according to Claim 2 in which the tube is part of an outlet tap.

6. A method of manufacturing a bag substantially as herein described with reference to and as illustrated in the accompanying drawings.

7. A bag for containing liquids substantially as herein described with reference to and as illustrated in the accompanying drawings.

8. Any novel combination or sub-combination disclosed and/or illustrated herein.